

## TNC Series (High Performance Polymer type Chip Tantalum Capacitors)

### Features

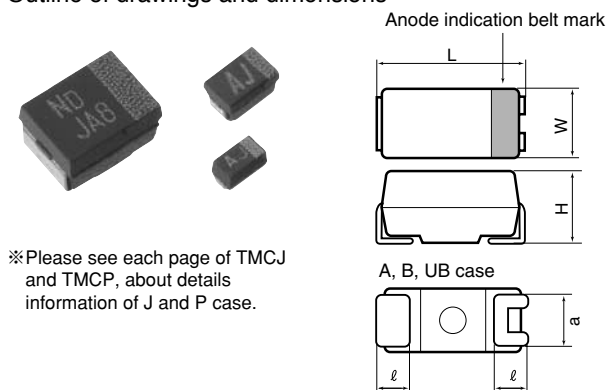
- This type reduces ESR by using high performance polymer based on our original manufacturing process.
- This type is most suitable for an output smoothing circuit that is used, for example, in a DC-DC converter requiring a small size, large capacitance, and low ESR.
- 260°C Reflow compatible for Bcase

Product code: (Example) TNC type B case 6.3 V 100  $\mu\text{F} \pm 20\%$  ESR 45m $\Omega$

**TNC B OJ 107 M T R (Z) F**

- TNC: Type of series
- B: Case size code
- OJ: Lead-free solder plating
- 107: Specific product code
- M: Packing polarity code
- T: With or without taping
- R: Capacitance tolerance code (M:  $\pm 20\%$ )
- (Z): Capacitance code
- F: Rated voltage code

### Outline of drawings and dimensions



※Please see each page of TMCJ and TMCP, about details information of J and P case.

### Dimensions

(Unit : mm)

Case code	Case size				
	L	W	H	ℓ	a
J	1.6 $\pm 0.1$	0.8 $\pm 0.1$	0.8 $\pm 0.1$	0.3 $\pm 0.15$	0.6 $\pm 0.1$
P	2.0 $\pm 0.2$	1.25 $\pm 0.2$	1.2 <sup>MAX</sup>	0.5 $\pm 0.2$	0.9 $\pm 0.1$
A	3.2 $\pm 0.2$	1.6 $\pm 0.2$	1.6 $\pm 0.2$	0.7 $\pm 0.3$	1.2 $\pm 0.2$
B	3.5 $\pm 0.2$	2.8 $\pm 0.2$	1.9 $\pm 0.2$	0.8 $\pm 0.3$	2.2 $\pm 0.2$
UB	3.5 $\pm 0.2$	2.8 $\pm 0.2$	1.2 <sup>MAX</sup>	0.8 $\pm 0.3$	2.2 $\pm 0.2$

### Standard value and case size

静電容量		定格電圧 (V.DC)			
		2.5	4	6.3	10
$\mu\text{F}$	記号	0E	0G	0J	1A
3.3	335			J,P	J,P
4.7	475			J,P,A	P,A
6.8	685			P,A	A
10	106		J,P,A	P,A	A
15	156		P,A	A	A
22	226		A,B	A	A,UB,B
33	336		A,B	A,UB,B	A,UB,B
47	476		A,UB,B	A,UB,B	UB,B
68	686		A,UB,B	UB,B	
100	107		UB,B	B	
150	157		B	B	
220	227	B	B		
330	337	B			

For ratings not covered the table, consult Holy Stone Polytech.

Product specifications	TNC	Test conditions JIS C5101-1:1998
Operating temperature range	-55°C ~ +105°C	
Rated voltage	DC2.5 ~ 10V	85°C
Surge voltage	DC3V ~ 13V	85°C
Derated voltage	DC1.6 ~ 6.3V	(105°C)
Capacitance	3.3 ~ 330 $\mu\text{F}$	120Hz
Capacitance tolerance	$\pm 20\%$	120Hz
Leakage current	Refer to standard product table	—
tan $\delta$	0.1 or less	120Hz
ESR (100kHz)	J case 500m $\Omega$ <sup>MAX</sup> P case 200m $\Omega$ , 500m $\Omega$ <sup>MAX</sup> A case 200m $\Omega$ , 500m $\Omega$ <sup>MAX</sup> UB case 70, 200m $\Omega$ <sup>MAX</sup> B case 15~200m $\Omega$ <sup>MAX</sup>	100kHz
Maximum permissible ripple current (100kHz, 20°C)	J case 320mArms <sup>MAX</sup> P case 360, 560mArms <sup>MAX</sup> A case 400, 620mArms <sup>MAX</sup> UB case 590, 1000mArms <sup>MAX</sup> B case 700~2190mArms <sup>MAX</sup>	100kHz
Temperature characteristics	Specified initial value	-55 105
	$\Delta\text{C/C}$	- -20~-0% 0~+30%
	tan $\delta$	0.10 0.14 -
	or less	
LC	Refer to standard product table	1CV or 30 $\mu\text{A}$ or less
Solder heat resistance	$\Delta\text{C/C}$ $\pm 20\%$ or less tan $\delta$ Specified initial value or less LC $\leq 0.1\text{CV}$ or $\leq 0.3\text{CV}$	Reflow Board surface peak temperature: 240 $\pm$ 5°C 220°C or more: within 30 sec.
Moisture resistance no load	$\Delta\text{C/C}$ +30% ~ -20% or less tan $\delta$ Specified initial value or less LC 300% or less Specified initial value or less	Leave at 40°C and 90 to 95%RH for 500 hours.
High-temperature load	$\Delta\text{C/C}$ $\pm 20\%$ or less tan $\delta$ Specified initial value or less LC 300% or less Specified initial value or less	85°C. The rated voltage is applied through a protective resistor of 3 $\Omega$ for 1000 hours.
Thermal shock	$\Delta\text{C/C}$ $\pm 20\%$ or less tan $\delta$ Specified initial value or less LC $\leq 0.1\text{CV}$ or $\leq 0.3\text{CV}$	Leave at -55°C, normal temperature, 105°C, and normal temperature for 30 min., 15 min., 30 min., and 15 min. Repeat this operation 5 times running.
Failure rate	1% / 1000hrs	85°C. The rated voltage is applied (through a protective resistor of 1 $\Omega$ /V).

※ This catalog is designed for providing general information. Please inquire of our Sales Department to confirm specifications prior to use.

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## Standard product tables - TNC series

Standard product tables - TNC series

Rated voltage V.DC	Capacitance μF	tan δ	Leakage current μA	Case code	Product name	ESR (100kHz) mΩ	Maximum permissible ripple current (20°C, 100kHz) mA <sub>rms</sub>		
2.5	220	0.10	55.0	B	TNCB0E227MTRF	70	1170		
		0.10	55.0	B	TNCB0E227MTRZF	35	1650		
		0.10	55.0	B	TNCB0E227MTRWF	15/300K	2190		
	330	0.10	82.5	B	TNCB0E337MTRF	70	1170		
		0.10	82.5	B	TNCB0E337MTRZF	35	1650		
		0.10	82.5	B	TNCB0E337MTRWF	15/300K	2190		
4	10	0.10	10.0	J	TNCJ0G106MTRF	500	320		
		0.10	5.0	P	TNCP0G106MTRF	500	360		
		0.10	5.0	P	TNCP0G106MTRXF	200	560		
		0.10	4.0	A	TNCA0G106MTRF	500	400		
		0.10	4.0	A	TNCA0G106MTRXF	200	620		
		0.10	10.0	P	TNCP0G156MTRF	500	360		
	15	0.10	10.0	P	TNCP0G156MTRXF	200	560		
		0.10	6.0	A	TNCA0G156MTRF	500	400		
		0.10	6.0	A	TNCA0G156MTRXF	200	620		
		0.10	8.8	A	TNCA0G226MTRF	500	400		
		0.10	8.8	A	TNCA0G226MTRXF	200	620		
		0.10	8.8	B	TNCB0G226MTRF	200	700		
	33	0.10	13.2	A	TNCA0G336MTRF	500	400		
		0.10	13.2	A	TNCA0G336MTRXF	200	620		
		0.10	13.2	B	TNCB0G336MTRF	200	700		
		0.10	18.8	A	TNCA0G476MTRF	500	400		
		0.10	18.8	A	TNCA0G476MTRXF	200	620		
		0.10	18.8	UB	TNCUB0G476MTRF	200	590		
	47	0.10	18.8	UB	TNCUB0G476MTRXF	70	1000		
		0.10	18.8	B	TNCB0G476MTRF	150	800		
		0.10	18.8	B	TNCB0G476MTRXF	70	1170		
		0.10	27.2	A	TNCA0G686MTRF	500	400		
		0.10	27.2	A	TNCA0G686MTRXF	200	620		
		0.10	27.2	UB	TNCUB0G686MTRF	200	590		
	68	0.10	27.2	UB	TNCUB0G686MTRXF	70	1000		
		0.10	27.2	B	TNCB0G686MTRF	150	800		
		0.10	27.2	B	TNCB0G686MTRXF	70	1170		
		0.10	40.0	UB	TNCUB0G107MTRXF	70	1000		
		0.10	40.0	B	TNCB0G107MTRF	70	1170		
		0.10	40.0	B	TNCB0G107MTRZF	45	1460		
	150	0.10	60.0	B	TNCB0G157MTRF	70	1170		
		0.10	60.0	B	TNCB0G157MTRZF	35	1650		
		220	0.10	88.0	B	TNCB0G227MTRF	70	1170	
			0.10	88.0	B	TNCB0G227MTRZF	35	1650	
		6.3	3.3	0.10	10.0	J	TNCJ0J335MTRF	500	320
				0.10	3.0	P	TNCP0J335MTRF	500	360
	4.7		0.10	10.0	J	TNCJ0J475MTRF	500	320	
			0.10	3.0	P	TNCP0J475MTRF	500	360	
	6.8		0.10	3.0	A	TNCA0J475MTRF	500	400	
			0.10	4.2	P	TNCP0J685MTRF	500	360	
	10		0.10	4.2	A	TNCA0J685MTRF	500	400	
			0.10	10.0	P	TNCP0J106MTRF	500	360	
			0.10	10.0	P	TNCP0J106MTRXF	200	560	
			0.10	6.3	A	TNCA0J106MTRF	500	400	
			0.10	6.3	A	TNCA0J106MTRXF	200	620	
			0.10	9.4	A	TNCA0J156MTRF	500	400	
	15		0.10	9.4	A	TNCA0J156MTRXF	200	620	
			0.10	13.8	A	TNCA0J226MTRF	500	400	
	22		0.10	13.8	A	TNCA0J226MTRXF	200	620	
			0.10	20.7	A	TNCA0J336MTRF	500	400	
			0.10	20.7	A	TNCA0J336MTRXF	200	620	
			0.10	20.7	UB	TNCUB0J336MTRF	200	590	
			0.10	20.7	UB	TNCUB0J336MTRXF	70	1000	
			0.10	20.7	B	TNCB0J336MTRF	200	700	
33	0.10		20.7	B	TNCB0J336MTRXF	70	1170		
	0.10		29.6	A	TNCA0J476MTRF	500	400		
	0.10		29.6	A	TNCA0J476MTRXF	200	620		
	0.10		29.6	UB	TNCUB0J476MTRF	200	590		
	0.10		29.6	UB	TNCUB0J476MTRXF	70	1000		
	0.10		29.6	B	TNCB0J476MTRF	150	800		
47	0.10		29.6	B	TNCB0J476MTRXF	70	1170		
	0.10		42.8	UB	TNCUB0J686MTRF	200	590		
	0.10		42.8	UB	TNCUB0J686MTRXF	70	1000		
	0.10		42.8	B	TNCB0J686MTRF	150	800		
	0.10		42.8	B	TNCB0J686MTRXF	70	1170		
	100		0.10	63.0	B	TNCB0J107MTRF	100	980	
0.10			63.0	B	TNCB0J107MTRXF	70	1170		
0.10			63.0	B	TNCB0J107MTRZF	45	1460		

Rated voltage V.DC	Capacitance μF	tan δ	Leakage current μA	Case code	Product name	ESR (100kHz) mΩ	Maximum permissible ripple current (20°C, 100kHz) mA <sub>rms</sub>	
6.3	100	0.10	63.0	B	TNCB0J107MTRVF	35	1650	
		0.10	94.5	B	TNCB0J157MTRF	100	980	
	150	0.10	94.5	B	TNCB0J157MTRXF	70	1170	
		0.10	94.5	B	TNCB0J157MTRZF	40	1550	
	10	3.3	0.10	10.0	J	TNCJ1A335MTRF	500	320
			0.10	5.0	P	TNCP1A335MTRF	500	360
4.7		0.10	10.0	P	TNCP1A475MTRF	500	360	
		0.10	10.0	P	TNCP1A475MTRXF	200	560	
		0.10	4.7	A	TNCA1A475MTRF	500	400	
		0.10	4.7	A	TNCA1A475MTRXF	200	620	
6.8		0.10	6.8	A	TNCA1A685MTRF	500	400	
		0.10	6.8	A	TNCA1A685MTRXF	200	620	
10		0.10	10.0	A	TNCA1A106MTRF	500	400	
		0.10	10.0	A	TNCA1A106MTRXF	200	620	
15		0.10	15.0	A	TNCA1A156MTRF	500	400	
		0.10	15.0	A	TNCA1A156MTRXF	200	620	
22		0.10	22.0	A	TNCA1A226MTRF	500	400	
		0.10	22.0	A	TNCA1A226MTRXF	200	620	
		0.10	22.0	UB	TNCUB1A226MTRF	200	590	
		0.10	22.0	UB	TNCUB1A226MTRXF	70	1000	
		0.10	22.0	B	TNCB1A226MTRF	200	700	
		0.10	22.0	B	TNCB1A226MTRXF	70	1170	
33		0.10	33.0	A	TNCA1A336MTRF	500	400	
		0.10	33.0	A	TNCA1A336MTRXF	200	620	
		0.10	33.0	UB	TNCUB1A336MTRF	200	590	
		0.10	33.0	UB	TNCUB1A336MTRXF	70	1000	
		0.10	33.0	B	TNCB1A336MTRF	200	700	
		0.10	33.0	B	TNCB1A336MTRXF	70	1170	
47	0.10	47.0	UB	TNCUB1A476MTRF	200	590		
	0.10	47.0	UB	TNCUB1A476MTRXF	70	1000		
	0.10	47.0	B	TNCB1A476MTRF	150	800		
	0.10	47.0	B	TNCB1A476MTRXF	70	1170		

### Marking indication TNC series

**J,P case**

- Simplified code of nominal capacitance (S : 4.7 μF)
- Simplified code of rated voltage (J : 6.3V)
- Anode indication belt mark

**A case**

- Simplified code of nominal capacitance (A7 : 10 μF)
- Simplified code of rated voltage (J : 6.3V)
- Marking code
- Anode indication belt mark

**B,UB case**

- Type of series
- Marking code
- Simplified code of rated voltage (J : 6.3V)
- Simplified code of nominal capacitance (S7 : 47 μF)
- Anode indication belt mark

### Marking code

Month Year	1	2	3	4	5	6	7	8	9	10	11	12
2011	a	b	c	d	e	f	g	h	j	k	l	m
2012	n	p	q	r	s	t	u	v	w	x	y	z
2013	A	B	C	D	E	F	G	H	J	K	L	M
2014	N	P	Q	R	S	T	U	V	W	X	Y	Z